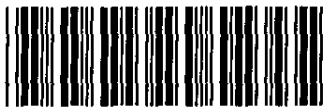

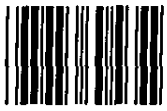

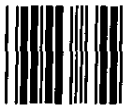

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DECL.

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UNITED STATES DISTRICT COURT

SOUTHERN DISTRICT OF CALIFORNIA

DAIMLERCHRYSLER AG and MERCEDES-BENZ USA, INC.

Plaintiffs,

v.

FEULING ADVANCED TECHNOLOGIES, INC. and JAMES J. FEULING,

Defendants.

JAMES J. FEULING, individually, and FEULING ADVANCED TECHNOLOGIES, INC., a Nevada corporation,

Counterclaimants,

v.

DAIMLERCHRYSLER AG and MERCEDES-BENZ USA, INC.

Counterclaim Defendants

No. 00-CV-1541 B (NLS)

DECLARATION OF JAMES M. LYONS IN SUPPORT OF PLAINTIFFS' OPPOSITION TO DEFENDANTS' MOTION FOR PARTIAL SUMMARY JUDGMENT OF PATENT INFRINGEMENT

Date: September 29, 2003
Time: 10:30 a.m.
Courtroom: 2
Judge: Hon. Rudi M. Brewster

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I, James M. Lyons, declare as follows:

1. I make this Declaration based upon my own personal knowledge and my familiarity with the matters recited herein. On March 14, March 28, June 6, and July 28, 2003, I filed Expert, Supplemental Expert, and Rebuttal Expert Reports in this action, and this Declaration supplements my prior testimony.

2. The purpose of this declaration is to respond to certain claims made by James M. Novak in his Declaration of August 28, 2003, and by Eugene W. Sheehan, Jr. in his Declaration of August 27, 2003, both of which were submitted in support of Defendants/Counterclaimants' Motion for Partial Summary Judgment, Infringement, filed with the court on August 29, 2003. If called upon to do so, I would testify in accord with the facts and opinions presented here.

3. In Paragraph 5 of his Declaration, Mr. Novak states that someone skilled in the art would consider the valves of the Mercedes 3.2 Liter V6 engine to be substantially uniformly arranged. Mr. Sheehan states in Paragraph 4.E. of his declaration that the valves of the Mercedes 3.2 Liter V6 engine are substantially uniformly arranged around the axis of the cylinder. I have examined the combustion chamber system of the Mercedes 3.2 Liter V6 engine and disagree with Mr. Novak because the valves of the Mercedes 3.2 Liter V6 engine are not substantially uniformly arranged. As one of ordinary skill in the art of combustion chamber system design, I understand the term "substantially uniformly arranged" to mean evenly spaced but allowing for small variations in arrangement due to manufacturing and machining tolerances as well as wear of parts. Based on my experience and materials I have reviewed, these differences would amount to much less than 1% of the distance between the valve centers or the distance between the valve centers and the axis of the cylinder in the Mercedes 3.2 Liter V6 engine.

4. Based on measurements made on the Mercedes 3.2 Liter V6 engine, the valves are not substantially uniformly arranged. The centers of the intake valves are closer to each other than they are to the center of the exhaust valve (by 2 mm) and the distance between the axis of the cylinder and the center of the intake valves is greater than the distance between the axis of the cylinder and the center of the exhaust valve (by 4 mm). The distance between the exhaust valve and the intake valves is about 5% greater than the distance between the intake valves and the difference between the axis of the cylinder to the center of the intake valve, and the center of the exhaust valve is about 15% of the distance between the axis of the cylinder and the center of the intake valve.

5. Mr. Novak claims at Paragraphs 12 and 16 of his declaration that the piston design of the Mercedes combustion chamber system is generally flat. Mr. Sheehan makes the same claim in Paragraph 4.I. of his declaration. I disagree with Mr. Novak and Mr. Sheehan because the piston design of the Mercedes 3.2 Liter V6 engine is not generally flat. Rather, the piston has been designed as a recessed piston with a large central recess or cavity formed in the face of the piston. Generally flat pistons for use with internal combustion engines are well known and have completely flat faces or flat faces that include small features such as valve cutouts. Recessed piston designs are also well known and are characterized by flat areas on the periphery of the piston and large central recessed areas of various shapes and recess depths.

6. Mr. Novak claims in paragraph 23 of his declaration that there are concave depressions around each valve seat of the Mercedes 3.2 Liter V6 engine immediately adjacent to the valve seat insert that resemble a portion of a hemisphere. Mr. Sheehan makes the same claim in Paragraph 4.L. of his declaration. I disagree with Mr. Novak and Mr. Sheehan. As I have stated previously, the intake and exhaust valves of the Mercedes 3.2 Liter V6 engine are housed in depressions that have a complex shape that

does not resemble a hemisphere or a portion of a hemisphere. The depressions are convex with a shape that resembles that of the end of a musical horn. There are concave segments but these are small and discontinuous, and do not form a depression that either resembles or relates to a hemisphere or to a portion of a hemisphere.

7. As I have stated previously, the Feuling patent defines the function of the hemispheric depressions and hemispherical recesses as being to provide the desired compression ratio for the engine. In the combustion chamber system of the Mercedes 3.2 Liter V6 engine, the compression ratio is established by the use of a recessed piston in combination with a pent-roof combustion chamber. The shallow recesses around the valves in the combustion chamber systems could be eliminated (or filled) and there would not be a significant change in the compression ratio of the combustion chamber system.

8. As I have discussed in my Expert and Supplemental Expert Reports, beginning in the early 1980s, Honda manufactured a range of motorcycle engines using three-valve-per-cylinder combustion chamber system designs with two intake valves and one exhaust valve and two spark plugs. These combustion chambers were used in combination with different piston designs, including generally flat pistons, pistons with raised central areas, and recessed pistons.

9. One of these engines, the Honda VT500, appeared in three variants—the VT500FT Ascot, VT500C Shadow, and VT500E. Photographs of the combustion chamber system from the VT500FT Ascot and of the combustion chamber system of the VT500C Shadow are shown in DC 001161, DC 006918 to 006925, DC 003443 to 003444, DC 006251, and DC 006246. The VT500E was described by Hutten in 1988 (see DC 004820 and DC 007795) and all three variants are described in a single common service manual (see DC 002094 to 002365). As shown in the photographs of the

VT500FT and VT500C, all three of the valves are housed in circular depressions. In these Honda engines, the centers of the intake valves are closer to each other than to the exhaust valve and the difference in the distance between the exhaust valve and the intake valves is about 6% greater than the distance between the intake valves (compared to 5% for the Mercedes 3.2 Liter V6 engine) and the difference between the axis of the cylinder to the center of the intake valve and the center of the exhaust valve is about 15% of the distance between the axis of the cylinder and the center of the intake valve (the same as in the Mercedes 3.2 Liter V6 engine). Two combinations of valve sizes have been reported to have been used with the Honda VT500, including the use of two 32 mm intakes with a 36 mm exhaust valve (VT500E). Given these valve sizes, the ratio of intake valve diameter to exhaust valve diameter was 1:1.1 and the ratio of total intake valve area to exhaust valve area was 0.63.

10. As discussed in my Expert and Supplemental Expert Reports, during the period from 1990 through at least 1992, DCAG designed a number of three-valve combustion chamber systems for use in its vehicles, including that shown in DC 004242 dated November 30, 1990. This design has three valves, two intakes and one exhaust, and two spark plugs. Based on the dimensions in the figure, the centers of the intake valves are closer to each other (40.4 mm) than to the exhaust valve (42.1 mm) and the distance between the exhaust valve and the intake valves is about 4% greater than the distance between the intake valves (compared to 5% for the Mercedes 3.2 Liter V6 engine) and the difference between the distance from the axis of the cylinder to the center of the intake valve (25.6 mm) and the center of the exhaust valve (21.2) is about 17% of the distance between the axis of the cylinder and the center of the intake valve (compared to 15% in the Mercedes 3.2 Liter V6 engine).

11. DCAG three-valve-per-cylinder designs that were developed before the filing of the '921 patent also include George Leipner's 1990 thesis, which documents the design of a three-valve combustion chamber system for use with a Mercedes-Benz M 119 V-8 engine. This design has three valves, two intakes and one exhaust, and two spark plugs. Based on the dimensions in the figure, the centers of the intake valves are closer to each other (39.5 mm) than to the exhaust valve (48 mm) and the distance between the exhaust valve and the intake valves is about 20% greater than the distance between the intake valves (compared to 5% for the Mercedes 3.2 Liter V6 engine) and the difference between the axis of the cylinder to the center of the intake valve (27 mm) and the center of the exhaust valve (24.5) is about 10% of the distance between the axis of the cylinder and the center of the intake valve (compared to 15% in the Mercedes 3.2 Liter V6 engine). The ratio of intake valve diameter (38 mm) to exhaust valve diameter (42 mm) is 1:1.1 and the ratio of total intake to total exhaust area is 61%.

I declare under penalty of perjury that the foregoing is true and correct and that this Declaration was executed by me on this 15th day of September 2003 in Sacramento, CA.

By: _____

James M. Lyons

PROOF OF SERVICE

I am a resident of the state of California, over the age of eighteen years, and not a party to the within action. My business address is Gray Cary Ware & Freidenrich, 401 B Street, Suite 2000, San Diego, California 92101-4240. On September 15, 2003, I served the within documents:

1. **MEMORANDUM OF LAW IN SUPPORT OF PLAINTIFFS' OPPOSITION TO DEFENDANTS; MOTION FOR PARTIAL SUMMARY JUDGMENT OF PATENT INFRINGEMENT;**

2. **DECLARATION OF LICIA E. VAUGHN IN SUPPORT OF PLAINTIFFS' OPPOSITION TO DEFENDANTS' MOTION FOR PARTIAL SUMMARY JUDGMENT OF PATENT INFRINGEMENT;**

3. **DECLARATION OF JAMES M. LYONS IN SUPPORT OF PLAINTIFFS' OPPOSITION TO DEFENDANTS' MOTION FOR PARTIAL SUMMARY JUDGMENT OF PATENT INFRINGEMENT; and**

4. **DECLARATION OF DR. MANFRED FORTNAGEL IN SUPPORT OF PLAINTIFFS' OPPOSITION TO DEFENDANTS' MOTION FOR PARTIAL SUMMARY JUDGMENT OF PATENT INFRINGEMENT.**

☐ by transmitting via facsimile the document(s) listed above to the fax number(s) set forth below on this date before 5:00 p.m.

☒ by placing the document(s) listed above in a sealed envelope with postage thereon fully prepaid, in the United States mail at San Diego, California addressed as set forth below.

☐ by personally delivering the document(s) listed above to the person(s) at the address(es) set forth below.

Paul R. Kennerson, Esq.
Kennerson & Grant LLP
101 West Broadway, Suite 1150
San Diego, CA 92101

Fax No.: 619-236-0555

I am readily familiar with the firm's practice of collection and processing correspondence for mailing. Under that practice it would be deposited with the U.S. Postal Service on that same day with postage thereon fully prepaid in the ordinary course of business. I am aware that on motion of the party served, service is presumed invalid if postal cancellation date or postage meter date is more than one day after date of deposit for mailing in affidavit.

I declare that I am employed in the office of a member of the Bar of or permitted to practice before this Court at whose direction the service was made.

I declare under penalty of perjury under the laws of the state of California that the above is true and correct.

Executed on September 15, 2003, at San Diego, California.

Lisa J. Watts

PROOF OF SERVICE BY HAND DELIVERY
(Completed by Messenger)

I am employed in the County of San Diego, state of California. I am over the age of 18 and not a party to the within cause. My business address is: 1500 State Street, Suite 245, San Diego, CA 92101.

I served the below listed document(s) described as:

1. **MEMORANDUM OF LAW IN SUPPORT OF PLAINTIFFS' OPPOSITION TO DEFENDANTS; MOTION FOR PARTIAL SUMMARY JUDGMENT OF PATENT INFRINGEMENT;**

2. **DECLARATION OF LICIA E. VAUGHN IN SUPPORT OF PLAINTIFFS' OPPOSITION TO DEFENDANTS' MOTION FOR PARTIAL SUMMARY JUDGMENT OF PATENT INFRINGEMENT;**

3. **DECLARATION OF JAMES M. LYONS IN SUPPORT OF PLAINTIFFS' OPPOSITION TO DEFENDANTS' MOTION FOR PARTIAL SUMMARY JUDGMENT OF PATENT INFRINGEMENT; and**

4. **DECLARATION OF DR. MANFRED FORTNAGEL IN SUPPORT OF PLAINTIFFS' OPPOSITION TO DEFENDANTS' MOTION FOR PARTIAL SUMMARY JUDGMENT OF PATENT INFRINGEMENT.**

on September 15, 2003 on the following parties to this cause by hand delivering a copy of the above document(s) as follows:

John L. Haller, Esq.
Neil F. Martin, Esq.
Brown, Martin, Haller & McClain
1660 Union Street
San Diego, CA 92101

Ph.: 619-238-0999

☒ By leaving a copy of the above document(s) with a receptionist in the offices of the above addressee(s).

☐ Finding no person in the office at a time between the hours of 9:00 a.m. and 5:00 p.m. when the service was made, the above document(s) were left in a conspicuous place in the office (see CCP § 1011(a)).

☐ The office of the attorney of record was closed between the hours of 9:00 a.m. and 5:00 p.m. and his residence address was either unknown or no one over the age of 18 years was at such residence and, therefore, I placed a copy of the above document(s) in the U.S. mail with postage thereon fully prepaid in a post office, mailbox, sub-post office, substation, mail chute, or other like facility regularly maintained by the U.S. Postal Service in San Diego, California.

I declare that I am employed in the office of a member of the Bar of or permitted to practice before this Court at whose direction the service was made.

I declare under penalty of perjury under the laws of the United States and of the state of California that the above is true and correct.

Executed on September 15, 2003, at San Diego, California.

Central Attorney Service